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APPENDIX OF PENDING CLAIMS
"Version with markings to show changes made"

We claim:

28 36. An apparatus for electrical detection of molecular interactions between an immobilized oligonucleotide probe and a target nucleic acid molecule, said apparatus comprising a supporting substrate comprising:

- a) a plurality of microelectrodes each comprising a conjugated polymer film and a different immobilized oligonucleotide probe;
- b) a voltage source connected to said microelectrodes;
- c) an electrolyte solution comprising a solution of Li⁺ ions; and
- d) a detector connected to said microelectrodes.

29 37. An apparatus for electrical detection of molecular interactions between an immobilized oligonucleotide probe and a target nucleic acid molecule, said apparatus comprising a supporting substrate comprising:

- a) a plurality of microelectrodes each comprising a polymer gel pad and a different immobilized oligonucleotide probe;
- b) a voltage source connected to said microelectrodes;
- c) an electrolyte solution comprising a solution of Li⁺ ions; and
- d) a detector connected to said microelectrodes.

30 38. An apparatus according to claim 28 36 or 37 29 wherein said apparatus further comprises a counter-electrode.

31 39. An apparatus according to claim 28 36 or 37 29 wherein said apparatus further comprises a reference electrode.

32 40. An apparatus according to claim 28 36 or 37 29 wherein said detector will detect changes in impedance at each microelectrode.

33 41. An apparatus according to claim 28 36 or 37 29 wherein said solution of Li⁺ ions comprises a solution of LiClO₄.

34 42. An apparatus according to claim 33 41 wherein said solution of LiClO₄ is about 0.1 M.

35 43. An apparatus according to Claims 28 36 or 37 29 wherein the microelectrodes comprise a conductive material and an insulating material.

36 44. An apparatus according to Claim 35 43 wherein the conductive material is solid or porous

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gold, silver, platinum, titanium, copper, metal oxide, metal nitride, metal carbide, or graphite carbon.

37 45. An apparatus according to Claim 36 44 wherein the conductive material is platinum.

38 46. An apparatus according to Claim 36 44 wherein the conductive material is gold.

39 47. An apparatus according to Claim 35 43 wherein the insulating material is glass, silicon, plastic, rubber, fabric, ceramic or a combination thereof.

40 48. An apparatus according to Claim 39 47 wherein the insulating material is silicon.

41 49. An apparatus according to Claim 39 47 wherein the insulating material is glass.

42 50. An apparatus according to Claim 35 43 wherein the conductive material is embedded in the substrate and the substrate comprises the insulating material.

43 51. An apparatus according to Claim 35 43 wherein the conductive material is silver/silver chloride.

44 52. An apparatus of Claims 28 and 29 36 or 37 wherein the supporting substrate comprises ceramic, glass, silicon, fabric or plastic.

45 53. An apparatus of Claim 28 36 wherein the conjugated polymer or copolymer used for probe attachment includes, but is not limited to, polypyrrole, polythiophene, polyaniline, polyfuran, polypyridine, polycarbazole, polyphenylene, poly(phenylenvinylene), polyfluorene, polyindole, their derivatives, their copolymers and their combinations thereof.

46 54. An apparatus of Claims 28 and 29 36 or 37 wherein probes are attached to microelectrodes using a neutral pyrrole matrix.

47 55. An apparatus of Claim 29 37 wherein the gel polymer pads are polyacrylamide.